Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2002P08684WO	**FOR FURTHER ACTION**	See Form PCT/IPEA/416
International application No. PCT/DE2003/004155	International filing date (*day/month/year*) 16 December 2003 (16.12.2003)	Priority date (*day/month/year*) 18 December 2002 (18.12.2002)
International Patent Classification (IPC) or national classification and IPC C25D 5/18		
Applicant SIEMENS AKTIENGESELLSCHAFT		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

   a. ☒ *(sent to the applicant and to the International Bureau)* a total of 3 sheets, as follows:

      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

   ☒ Box No. I Basis of the report
   ☐ Box No. II Priority
   ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   ☐ Box No. IV Lack of unity of invention
   ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   ☐ Box No. VI Certain documents cited
   ☐ Box No. VII Certain defects in the international application
   ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 01 July 2004 (01.07.2004)	Date of completion of this report 15 April 2005 (15.04.2005)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/DE2003/004155

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language _____, which is language of a translation furnished for the purpose of:

☐ international search (under Rules 12.3 and 23.1(b))

☐ publication of the international application (under Rule 12.4)

☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ The international application as originally filed/furnished

☒ the description:

pages 1-7, as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

pages _____, as originally filed/furnished

pages* _____, as amended (together with any statement) under Article 19

pages* 1-9 received by this Authority on 23 June 2004 (23.06.2004)

pages* _____ received by this Authority on _____

☒ the drawings:

pages 1/2-2/2, as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/DE 03/04155

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-9	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-9	NO
Industrial applicability (IA)	Claims	1-9	YES
	Claims		NO

2. Citations and explanations

1. Reference is made to the following documents:

D2: US-A-5 935 407 (NENOV KRASSIMIR P ET AL.) 10 August 1999 (1999-08-10)

D3: DATABASE WPI Section Ch, Week 200424 Derwent Publications Ltd., London, GB; Class M11, AN 2004-249196 XP002282825 -& DK 173 515 B1 (BJORNO L) 22 January 2001 (2001-01-22)

D4: DATABASE WPI Section Ch, Week 199011 Derwent Publications Ltd., London, GB; Class M11, AN 1990-078795 XP002281077 & JP 02 030790 A (SEIKO DENSHI KOGYO KK) 1 February 1990 (1990-02-01)

D5: DE 22 61 782 A (BATTELLE INSTITUT E V) 20 June 1974 (1974-06-20)

D6: EP-A1-0 443 877 (BAJ LTD) 28 August 1991 (1991-08-28)

D7: DE 102 59 365 A1 (SIEMENS AG) 30 October 2003 (2003-10-30)

D8: BRADLEY ET AL.: "Pulse-plating of copper-nickel alloys from a sulfamate solution" J. Chem. Soc, Faraday Trans., 1996, Vol. 92, pages 4015-4019, XP632318A

D8 was not cited in the international search report. A copy of the document is attached.

2. Amendments to the claims as originally filed

The amendments submitted with the letter of 17 June 2004 introduce substantive matter which, contrary to PCT Article 34(2)(b), goes beyond the disclosure in the international application as filed. The amendments are as follows: addition to the first claim, lines 20 and 21, "wherein a first block (37) is followed by a second block (37) of the same polarity". It is not clear which passage in the description supports this amendment. If this amendment should, however, be supported by the pulse sequence shown in figure 2, then the full sequence would have to be indicated in the claim (e.g. as on page 5, lines 23-32). The insertion of parts thereof taken out of context is inconsistent with PCT Article 34(2)(b).

The discussion below is based on the new claim 1 without the inadmissible amendment, i.e. the discussion is based on lines 3-19 of the first corrected sheet.

3. Novelty

The present application satisfies the requirements of PCT Article 33(1) because the subject matter of claim 1 is novel (PCT Article 33(2)).

D8 (page 4015, column 1, lines 1-8) discloses a method for the electrodeposition of a compositionally modelled alloy having two components (according to D8, page 4015, column 1, lines 14-17, copper-nickel systems are admirably suited to this purpose). Two current pulses or voltage pulses of different levels are used for the deposition,

i.e. two blocks, so that alloy sublayers consisting mainly of a first element or a second element are deposited alternately. The complete layer therefore has, as it were, a modulated gradient in its material composition.

By contrast, the first claim of the present application claims a more complex pulse sequence where each block consists of two or more pulses.

4. Inventive step

4.1. The present application does not satisfy the requirements of PCT Article 33(1) because the subject matter of claim 1 does not involve an inventive step (PCT Article 33(3)).

D8 is considered to be the prior art closest to the subject matter of claim 1. Said document discloses a method for the electrodeposition of an alloy (D8, page 4015, abstract, line 1).

The subject matter of claim 1 therefore differs from the known alloy deposition method in that claim 1 claims a more complex pulse sequence where each block consists of two or more pulses.

The problem addressed by the present invention can therefore be considered that of finding alternative deposition conditions for the deposition of alloys of this kind.

The solution proposed in claim 1 of the present application cannot be regarded as inventive (PCT Article 33(3)) for the following reasons:

The pulse sequence used in D8 (page 4015, column 1, lines 1-8) consists of a modulated current/voltage signal having two different values, each of which is adapted to the deposition required. The division of these two signals into two blocks, each having a plurality of pulses, as per claim 1 of the present application does not appear to be inventive, since this division does not produce any unforeseeable and/or surprising effects. Furthermore, no details of such effects are given in the application. Rather, the present application emphasises that the use of one current pulse per block or more than one current pulse per block is equally advantageous (page 5, second paragraph, of the present application).

Deposition with pulse blocks in a sequence is known from D5 (claims 1 and 2). According to D5, therefore, it is normal for pulse blocks to be used to provide better control of the resultant composition. For a person skilled in the art it would therefore appear obvious to optimise the method by modifying the pulse parameters.

To summarise, the resultant layers in D8 (page 4015, column 1, lines 1-8) and in the present application (page 3, lines 12 and 13; page 4, lines 14-18) have a gradient in their alloy composition by reason of the modulated current/voltage signals. The resultant alloy layers are therefore similar, and the different parameters of the current/voltage signals used do not appear to have a surprising effect. The method defined in claim 1 therefore represents an equivalent alternative method. Since the use of pulse blocks for alloy deposition is known *per se*, the present subject matter does not appear to involve an inventive step.

4.2. For the same reasons, the specific sequence

indicated in figure 2 and on page 5, lines 23-32, of the description in the present application also appears to lack an inventive step.

5. Dependent claims

It is not clear which of dependent claims 2-9 contain features that in combination with the features of any claim to which they refer back satisfy the PCT inventive step requirements (cf. D2-D7 and the relevant passages cited in the search report).